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Claims

[c1] 1. A Method for sterilizing fluent material in large volume by radiation of ultraviolet rays, said method comprising the steps of:
(a) guiding and/or forcing fluent material through filter(s) to remove large particles;
(b) using circuitous sterilizing chamber(s) with roundabout path(s), or spiral path(s), or sinuous path(s), or zigzag path(s), or other similar shapes of paths to contain said fluent material;
(c) employing intense UV irradiation to kill all live microorganisms in said fluent material passing through said chamber(s);
(d) converting ozone in air into oxygen when dealing with air;
(e) discharging sterilized fluent material out of said chamber(s).

[c2] 2. Apparatus for sterilizing fluent material in large volume by radiation of ultraviolet rays, said apparatus comprising:
(a) an inlet *1* guiding in fluent material for sterilizing;
(b) a power unit *2* positioned in said inlet *1*;

(c) an inlet filter *3* connected with said inlet *1* to remove fairly large particles from said fluent material;
(d) a circuitous sterilizing chamber *1 0* connected with said inlet filter unit*3*;
(e) a group of UV light tubes *1 5* positioned, along the flow direction, inside said chamber *1 0* providing high-density ultraviolet radiation to irradiate passing said fluent material;
(f) connected with said chamber *1 0*, an outlet filter unit*1 3* to remove any particles larger than the requirements of application;
(g) a catalytic filter comprised in said outlet filter unit*3* to convert ozone into oxygen;
(h) an inspection window or a sample faucet*1 2* for taking testing samples;
(i) an outlet*1 1* extending from said outlet filter*1 3* to discharge sterilized fluent material.

[c3] 3. The apparatus of claim 2 wherein said circuitous sterilizing chamber *10* may form roundabout path(s), or spiral path(s), or sinuous path(s), or zigzag path(s), or other similar shapes of paths for the purpose of increasing UV exposure.

[c4] 4. The apparatus of claim 2 wherein said chamber *1 0* is constructed with smooth curved flow guiding interior *7* at every turning section to form flow low flow resistant

chamber.

[c5] 5. The apparatus of claim 2 wherein said chamber*1 0* has polished internal reflecting mirror surfaces *9* to increase UV killing effect.

[c6] 6. The apparatus of claim 2 comprises UV visual inspection window(s)*5* in every section of said chamber*1 0.*

[c7] 7. The apparatus of claim 2 further comprises UV sensor(s)*6* in every section of said chamber*1 0* as auto-feedback mechanism.

[c8] 8. The apparatus of claim 2 further comprises an inspection window or a sample faucet*1 2* on said outlet *1 1*.

[c9] 9. The apparatus of claim 2 wherein ozone generation is suppressed by use of non-ozone germicidal lamps.

[c10] 10. The apparatus of claim 2 wherein an outlet filter unit *1 3* includes a catalytic filter to convert ozone into oxygen when dealing with air.